

WHAT IS CLAIMED IS:

1. A substrate for forming electron source in which an electron emission device is disposed comprising:

5 a substrate containing Na;

10 a first layer containing SiO₂ as a main component formed directly or indirectly on said substrate; and
a second layer containing electron conductive oxide formed directly or indirectly on said substrate.

15 102 2. The substrate for forming electron source according to claim 1, wherein said first layer is formed on said substrate (containing Na), and said second layer is formed on the first layer.

15 1. 3. The substrate for forming electron source according to claim 2, wherein said second layer contains SiO₂ as its ingredient.

20 20 4. The substrate for forming electron source according to claim 2, wherein said first layer contains at least one kind of element to be selected from an element group comprising P, B, and Ge.

25 1. 5. The substrate for forming electron source according to claim 3, wherein said first layer contains at least one kind of element to be selected from an

element group comprising P, B, and Ge.

6. The substrate for forming electron source according to claim 1, wherein said second layer is
5 formed on said substrate containing Na, and said first layer is formed on the second layer.

7. The substrate for forming electron source according to claim 6, wherein said second layer
10 contains SiO₂ as its ingredient.

8. The substrate for forming electron source according to claim 6, wherein said first layer contains at least one kind of element to be selected from an
15 element group comprising P, B, and Ge.

9. The substrate for forming electron source according to claim 7, wherein said first layer contains at least one kind of element to be selected from an
20 element group comprising P, B, and Ge.

10. The substrate for forming electron source according to any of claims 1 through 9, wherein said electron emission device comprises:

25 a conductive film having an electron emission portion which is disposed on said first or second layer; and

a pair of electrodes connected with the conductive film.

11. An electron source comprising:

5 a substrate according to any one of claims 1 through 9; and

an electron emission device disposed on said first layer or said second layer of the substrate.

10 12. An electron source comprising:

a substrate according to any one of claims 1 through 9; and

a plurality of electron emission devices disposed on said first layer or said second layer of the
15 substrate.

13. An electron source comprising:

a substrate according to any one of claims 1 through 9; and

20 a plurality of electron emission devices disposed on said first layer or said second layer of the substrate; and

25 a plurality of row direction wirings and a plurality of column direction wirings in which the plurality of electron emission devices are matrix-wired.

14. The electron source according to claim 11,
wherein said electron emission device comprises:
a conductive film having an electron emission
portion which is disposed on said first or second
layer; and
5 a pair of electrodes connected with the conductive
film.
- 10 15. The electron source according to claim 12,
wherein said electron emission device comprises:
a conductive film having an electron emission
portion which is disposed on said first or second
layer; and
15 a pair of electrodes connected with the conductive
film.
16. The electron source according to claim 13,
wherein said electron emission device comprises:
a conductive film having an electron emission
portion which is disposed on said first or second
layer; and
20 a pair of electrodes connected with the conductive
film.
- 25 17. An image forming apparatus comprising:
an electron source according to claim 11; and
an image forming member to form an image with

irradiation of electrons emitted from the electron source.

18. An image forming apparatus comprising:

5 an electron source according to claim 12; and
 an image forming member to form an image with
 irradiation of electrons emitted from the electron
 source.

10 19. An image forming apparatus comprising:
 an electron source according to claim 13; and
 an image forming member to form an image with
 irradiation of electrons emitted from the electron
 source.

15 20. An image forming apparatus comprising:
 an electron source according to claim 14; and
 an image forming member to form an image with
 irradiation of electrons emitted from the electron
 source.

20 21. An image forming apparatus comprising:
 an electron source according to claim 15; and
 an image forming member to form an image with
 irradiation of electrons emitted from the electron
 source.

22. An image forming apparatus comprising:
an electron source according to claim 16; and
an image forming member to form an image with
irradiation of electrons emitted from the electron
source.

23. A manufacturing method of a substrate for
forming electron source with which an electron emission
device is formed, wherein a first layer with SiO₂ as its
main component, and a second layer containing electron
conductive oxide are formed on a substrate containing
Na.

24. The manufacturing method of a substrate for
forming electron source according to claim 23, wherein
said first and second layers are formed with chemical
film-forming method.

25. The manufacturing method of a substrate for
forming electron source according to claim 23, wherein
forming of said first and second layers comprises:

a process of forming film with CVD method by using
organic silicon compound as material source; and
a process of forming film with CVD method by using
organic metal compound to form electron conductive
oxide in addition to said organic silicon compound as
material source.

26. The manufacturing method of a substrate for forming electron source according to claim 23, wherein forming of said first and second layers comprises:

- a process of forming a coat layer containing
5 organic silicon compound;
a process of forming a coat layer containing
organic silicon compound and electron conductive oxide
fine particles; and
a process of heating said both coat layer.

10 27. A manufacturing method of an electron source comprising:

a process in which a first layer with SiO_2 as its
main component, and a second layer containing electron
15 conductive oxide are formed on a substrate containing
Na; and

a process of forming an electron emission device
on said first layer or on said second layer.

20 28. The manufacturing method of an electron source according to claim 27, wherein said electron emission device is an electron emission device comprising carbon film, and the electron emission device is formed on a second layer containing oxide of
25 at least one kind of element to be selected from In,
Sn, Sb, and Re as said electron conductive oxide.

29. The manufacturing method of an electron source according to claim 27, wherein said electron emission device is an electron emission device comprising a carbon film, and said second layer is a 5 layer containing SiO_2 , and the electron emission device is formed on the second layer.

30. The manufacturing method of an electron source according to claim 27, wherein said electron 10 emission device is an electron emission device comprising a carbon film, and the electron emission device is formed on the first layer with said SiO_2 as a main component.

15 31. A manufacturing method of an image forming apparatus comprising:
an electron source, and
an image forming member to form an image with
irradiation of electrons emitted from the electron
20 source,
wherein said electron source is manufactured by a
method according to any one of claims 27 through 30.

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